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Executive Director-
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U S WEST

EX PARTE

June 10, 1996

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, NW, Room 222, SC-1170
Washington, DC 20554

RE: CC Docket No. 93-162

Dear Mr. Caton:

Attached are two copies of material that was sent to Mr. Richard Kwiatskowski of the Competitive Pricing Division, at his request. In accordance with Commission Rule 1.1206(a)(1), this material is being filed with your office for inclusion in the public record.

Acknowledgment and date of receipt of this submission are requested. A copy of this transmittal letter is provided for this purpose.

Please contact me if you have questions

Sincerely,

Attachments

cc: Mr. Richard Kwiatskowski

OH

RE: DSX Cross Connect Cable Limits and "POT Bay" Inquiry

The attached drawings show what the cable length limits are for DSX-1 and DSX-3 arrangements. The lengths expect the use of typical cable, such as 22 AWG ABAM for DS1 circuits and WE Co. 728 A for DS3 circuits. USWC's DSX engineering, as demonstrated on the attached diagrams, reflect the nationally standardized, DSX cross-connect arrangements as specified in American National Standards Institute document "Digital Hierarchy-Electrical Interfaces," ANSI T1.102-1993.

As shown on Attachment 1, there are two primary critical lengths. The first critical length is from the Interconnector Designated Equipment (IDE) to the first DSX panel jack and from the last DSX panel jack to the USWC network equipment, (eg., DS1 or DS3 equipment). The maximum length for the latter segment is 655' for a DS1 and 450' for a DS3. The distance limitation from the first DSX panel jack to the next DSX panel jack is 85' for DS1 and 27' for DS3. As shown on Attachment 2, if the maximum distances must be exceeded, a repeater(s) must be added. However, once a repeater has been added, the maximum distances increase to 450' and 655' as shown.

POT Bay

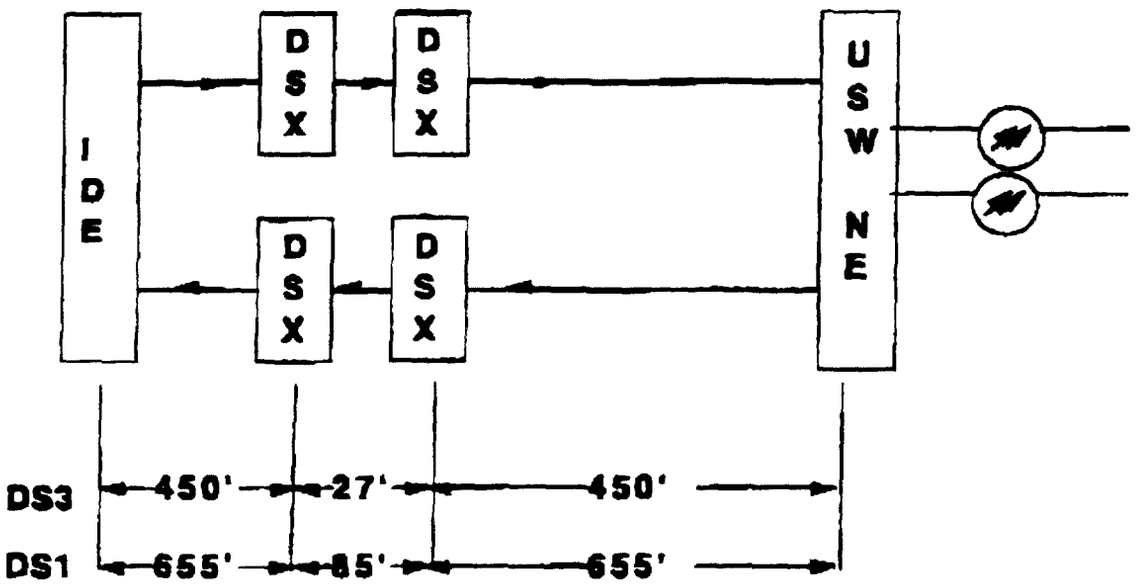
Attachment 2 also demonstrates physical collocation where there is a cage around the customer's leased physical space which holds the customer's equipment. Although USWC does not use the term "POT Bay," USWC presumes it is a point of termination similar to the DSX panel utilized by USWC to originate and terminate Physical EIC services. With Physical EIC, USWC places a DSX panel in the cage for originating and terminating services. The provision of the DSX panel for Physical EIC is necessary to allow the Collocator to control the assignment of its circuits to the EICT and to provide a point of interface for testing and trouble diagnosis. The DSX panel utilized by USWC is the same as the others shown on Attachments 1 and 2. The term "zero level testing" is an analog term. USWC presumes that the term is being referred to as something similar to the "templated signal" utilized by USWC in its DSXs.

RE: Cost of Repeaters

On the Tariff Review Plan (TRP), USWC includes the repeater in its EIC Channel Termination (EICT) rate element and as such included the costs in the EICT rate element on the TRP pages presented in the April 26, 1994 Ex Parte. However, as requested, USWC has broken out the repeater costs from the affected TRP pages, as displayed on Attachments 3 and 4. Attachment 3 is for DS1 EICT and Attachment 4 is for DS3 EICT. On these Attachments, the first column "Element #1" represents the material presented in the Ex Parte (i.e., the EICT with the repeater). "Element 2" is the cost of the repeater alone. "Element 3" is the cost of the EICT alone (Element 1 - Element 2 = Element 3). USWC has made no attempt to display Ratios (lines 55 and 56) for "Elements 2 and 3" since these elements have no tariffed rates, the ratios would be meaningless.

ATTACHMENT 1

Typical Cable Length Limits



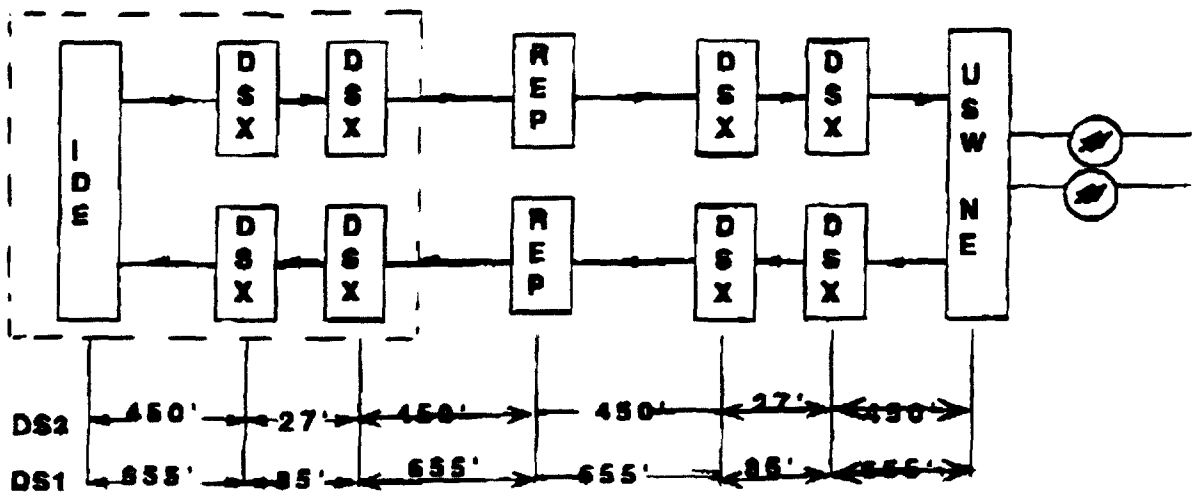
NOTES:

1. Standard DSX -N Templated Signals.
2. Network Element Line Build Outs must be set for actual cable length to the DSX.
3. Reference is *Digital Hierachy-Electrical Interfaces* , ANSI T1.102-1993.
4. Each pair of DSX apperances signifies two transmision equipment terminations and cross-connect or patch cabling linking them.
5. Acronyms: IDE – Interconnector Designated Equipment
   REP – Digital Repeater
   NE – Network Element
   DS1 – Digital Signal level 1 (1.544 Mbps)
   DS3 – Digital Signal level 3 (44.736 Mbps)

W. R. Wyooff
6/3/96

ATTACHMENT 2

Typical Cable Length Limits for Two DSX-N cross-connect areas linked through digital regenerators (repeaters).



NOTES:

1. Standard DSX -N Templated Signals.
2. Network Element Line Build Outs must be set for actual cable length to the DSX.
3. Reference is *Digital Hierachy-Electrical Interfaces*, ANSI T1.102-1993.
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   NE – Network Element
   DS1 – Digital Signal level 1 (1.544 Mbps)
   DS3 – Digital Signal level 3 (44.736 Mbps)

W. R. Wycoff
6/3/98

ATTACHMENT 3

DS1RGN2.XLS

DS1 CROSS-CONNECTION -EQPT FUNCTION
DS1 EICT
RECURRING COSTS

		Rate Element #1 DS1 EICT	Rate Element #2 DS1 REGEN	Rate Element #3 DS1 W/O REGN	Rate Element #4
1	Total Investment	$480.52			
2	Regenerators -Account 357C		$40.20	$360.32	
3	List name - Pt 32 Acct no. - Dep. Life				
4	List name - Pt 32 Acct no. - Dep. Life				
5	List name - Pt 32 Acct no. - Dep. Life				
6	List name - Pt 32 Acct no. - Dep. Life				
7	List name - Pt 32 Acct no. - Dep. Life				
8	List name - Pt 32 Acct no. - Dep. Life				
9	List name - Pt 32 Acct no. - Dep. Life				
10	List name - Pt 32 Acct no. - Dep. Life				
11	List name - Pt 32 Acct no. - Dep. Life				
12	List name - Pt 32 Acct no. - Dep. Life				
13	List name - Pt 32 Acct no. - Dep. Life				
14	List name - Pt 32 Acct no. - Dep. Life				
15	List name - Pt 32 Acct no. - Dep. Life				
16	List name - Pt 32 Acct no. - Dep. Life				
17	List name - Pt 32 Acct no. - Dep. Life				
18	List name - Pt 32 Acct no. - Dep. Life				
19	List name - Pt 32 Acct no. - Dep. Life				
20	List name - Pt 32 Acct no. - Dep. Life				
21	Depreciation Expense	$48.65	$4.48	$44.17	
22	Cost of Money 11.5 %	$27.01	$2.17	$24.84	
23	Federal Income Tax	$11.88	$0.98	$10.90	
24	State and Local Income Tax				
25	Other Tax: list taxes				
26	AdValorem	$5.89	$0.50	$5.39	
27	List:				
28	List:				
29	List:				
30	List:				
31	List:				
32	List:				
33	Maintance Expense	$7.74	$0.83	$6.91	
34	Admin and Other Expense: List exp.	$10.78			
35	Product Management - Account 6611	$1.53	$0.12	$1.41	
36	Sales - Account 6612	$0.71	$0.39	$0.32	
37	Number Services - Account 6620	$0.54	$0.05	$0.49	
38	External Relations - Account 6722	$0.27	$0.02	$0.25	
39	General Office Exp. - Account 6724-7	$0.36	$0.18	$0.18	
40	Uncollectables - Account 5301-2	$0.80	$0.08	$0.72	
41	Computers - Account 6124	$0.35	$0.09	$0.26	
42	Business Fees	$0.82	$0.08	$0.74	
43	Billing and Collection	$5.34	$0.48	$4.86	
44	List name - Pt 32 Acct no.				
45	List name - Pt 32 Acct no.				
46	List name - Pt 32 Acct no.				
47	List name - Pt 32 Acct no.				
48	List name - Pt 32 Acct no.				
49	List name - Pt 32 Acct no.				
50	List name - Pt 32 Acct no.				
51	Annual Cost per Unit	$112.05	$10.43	$101.62	
52	Monthly Cost per Unit	$9.34	$0.87	$8.47	
53	Monthly Rate per Unit	$13.05			
54	Unit of Measurement		PER TERMINATION		
55	Ratio: Rate / Direct Costs	$1.65			
56	Ratio: Rate / Unit Costs	$1.40			

ATTACHMENT 4

REGNTRP2.XLS

DS3 CROSS CONNECTION - EQPT FUNCTION
DS3 EICT
Recurring Costs

		Rate Element #1 DS3 EICT	Rate Element #2 DS3 Regen	Rate Element #3 DS3 WO REGN	Rate Element #4
1	Total Investment	$5,193.95		4937.4	
2	Regenerators -Account 357C		$256.55		
3	List name - Pt 32 Acct no. - Dep. Life				
4	List name - Pt 32 Acct no. - Dep. Life				
5	List name - Pt 32 Acct no. - Dep. Life				
6	List name - Pt 32 Acct no. - Dep. Life				
7	List name - Pt 32 Acct no. - Dep. Life				
8	List name - Pt 32 Acct no. - Dep. Life				
9	List name - Pt 32 Acct no. - Dep. Life				
10	List name - Pt 32 Acct no. - Dep. Life				
11	List name - Pt 32 Acct no. - Dep. Life				
12	List name - Pt 32 Acct no. - Dep. Life				
13	List name - Pt 32 Acct no. - Dep. Life				
14	List name - Pt 32 Acct no. - Dep. Life				
15	List name - Pt 32 Acct no. - Dep. Life				
16	List name - Pt 32 Acct no. - Dep. Life				
17	List name - Pt 32 Acct no. - Dep. Life				
18	List name - Pt 32 Acct no. - Dep. Life				
19	List name - Pt 32 Acct no. - Dep. Life				
20	List name - Pt 32 Acct no. - Dep. Life				
21	Depreciation Expense	$515.13	$26.58	$486.55	
22	Cost of Money 11.5%	$285.95	$13.82	$272.13	
23	Federal Income Tax	$126.80	$6.22	$120.58	
24	State and Local Income Tax				
25	Other Tax: list taxes				
26	AdValorem	$62.42	$3.21	$59.21	
27	List:				
28	List:				
29	List:				
30	List:				
31	List:				
32	List:				
33	Maintance Expense	$81.91	$5.28	$76.63	
34	Admin and Other Expense: List exp.	$114.16		$114.16	
35	Product Management - Account 6611	$16.17	$0.76	$15.41	
36	Sales - Account 6612	$7.58	$2.49	$5.09	
37	Number Services - Account 6620	$5.75	$0.30	$5.45	
38	External Relations - Account 6722	$2.84	$0.13	$2.71	
39	General Office Exp. - Account 6724-7	$3.83	$1.13	$2.70	
40	Uncollectables - Account 5301-2	$9.14	$0.50	$8.64	
41	Computers - Account 6124	$3.75	$0.55	$3.20	
42	Business Fees	$8.63	$0.49	$8.14	
43	Billing and Collection	$56.49	$3.09	$53.40	
44	List name - Pt 32 Acct no.				
45	List name - Pt 32 Acct no.				
46	List name - Pt 32 Acct no.				
47	List name - Pt 32 Acct no.				
48	List name - Pt 32 Acct no.				
49	List name - Pt 32 Acct no.				
50	List name - Pt 32 Acct no.				
51	Annual Cost per Unit	$1,186.39	$66.55	$1,119.84	
52	Monthly Cost per Unit	$98.87	$5.55	$93.32	
53	Monthly Rate per Unit	$181.00			
54	Unit of Measurement	PER TERMINATION			
55	Ratio: Rate / Direct Costs	$2.03			
56	Ratio: Rate / Unit Costs	$1.83			

Annex B
(informative)

Manual DS*N* cross-connect characteristics

B.1 General

The interface specifications in this standard are written so as to not dictate any particular technological approach to providing the interface. This annex describes details of the manual cross-connect frame technology that provides these interface functions in present networks. Implementation of an interface with electronic cross-connect technology would alter a number of these details, particularly in the area of return loss, insertion loss, and crosstalk loss.

The North American cross-connects are designated DSX-*N*, where *N* indicates the level (DS*N*) of the digital network interconnected at that cross-connect. Thus, DS1 equipment is interconnected at the DSX-1 cross-connect, DS1A equipment is interconnected at the DSX-1A cross-connect, and so on. In designating the physical connection to these cross-connects, the distribution frame jack connected to a pair bringing signals to the distribution frame is designated the out-jack. The distribution frame jack connected to a pair carrying signals away from the distribution frame is designated the in-jack. Widespread practice references the interface to the out-jack appearance on a cross-connect.

The detailed electrical characteristics of typical cables used to connect equipment to and from cross-connects appear in annex C. Maximum cable lengths in use, based on current engineering practice in networks is included for each of the cross-connect implementation descriptions.

B.2 Implementation descriptions

B.2.1 DSX-1

DSX-1 cross-connects can be engineered in a variety of configurations in the network. A simplified schematic diagram for a DSX is shown for reference in figure B.1.

Typical electrical parameters associated with the DSX-1 cross-connect include:

- The insertion loss of the DSX-1 is typically less than the loss of 85 feet of 22 gauge cross-connect wire.

- The return loss at the DSX-1 is typically greater than 26 dB at 772 kHz. The measurement is made at the out-jack including the effect of 85 feet of 22 gauge cross-connect or patch cabling to an in-jack which is terminated in 100 ohms ±5% tolerance.

- The crosstalk loss at the DSX-1 is typically greater than 55 dB at 772 kHz between the out-jack and the in-jack of adjacent signal paths. All other jacks are terminated with 100 ohms ±5% tolerance terminations.

- Protected (non-intrusive) monitoring access is provided through a high impedance bridging circuit consisting of 432 ohm ±5% tolerance resistors connected to the tip and ring conductors at the out-jack. This provides a monitor level 19.64 dB ±0.87 dB below the signal power.

- Typical engineering rules constrain cabling to and from equipment to the DSX-1 cross-connect to up to 655 feet of multi-pair 22 AWG office cable with overall outer shield. This cable is also widely known as 22 AWG ABAM.

B.2.2 DSX-1A

DSX-1A cross-connects can be engineered in a variety of configurations in the network. A simplified schematic diagram for a DSX is shown for reference in figure B.1. Typical electrical parameters associated with the DSX-1A cross-connect include:

- The insertion loss of the DSX-1A is typically less than the loss of 85 feet of 22 gauge cross-connect wire.

- The return loss of the DSX-1A is typically greater than 26 dB at 1.024 MHz. The measurement is made at the out-jack including the effect of 85 feet of 22 gauge cross-con-

nect or patch cabling to an in-jack which is terminated in 100 ohms ±5% tolerance.

– The crosstalk loss of the DSX-1A is typically greater than 55 dB at 1.024 MHz between the out-jack and the in-jack of adjacent signal paths. All other jacks are terminated with 100 ohms ±5% tolerance terminations.

– Protected (non-intrusive) monitoring access is provided through a high impedance bridging circuit consisting of 432 ohm ±5% tolerance resistors connected to the tip and ring conductors at the out-jack. This provides a monitor level 19.64 dB ±0.87 dB below the signal power.

– Typical engineering rules constrain cabling to and from equipment to the DSX-1A cross-connect to up to 655 feet of multi-pair 22 AWG office cable with overall outer shield. This cable is also widely known as 22 AWG ABAM.

B.2.3 DSX-1C

DSX-1C cross-connects can be engineered in a variety of configurations in the network. A simplified schematic diagram for a DSX is shown for reference in figure B.1. Typical electrical parameters associated with the DSX-1C cross-connect include:

– The insertion loss of the DSX-1C is typically less than the loss of 85 feet of 22 gauge cross-connect wire.

– The return loss of the DSX-1C is typically greater than 26 dB at 1.576 MHz. The measurement is made at the out-jack including the effect of 85 feet of 22 gauge cross-connect or patch cabling to an in-jack which is terminated in 100 ohms ±5% tolerance.

– The crosstalk loss of the DSX-1C is typically greater than 55 dB at 1.576 MHz between the out-jack and the in-jack of adjacent signal paths. All other jacks are terminated with 100 ohms ±5% tolerance terminations.

– Protected (non-intrusive) monitoring access is provided through a high impedance bridging circuit consisting of 432 ohm ±5% tolerance resistors connected to the tip and ring conductors at the out-jack. This provides a monitor level 19.64 dB ±0.87 dB below the signal power.

– Typical engineering rules constrain cabling to and from equipment to the DSX-1C cross-connect to up to 655 feet of multi-pair 22 AWG office cable with overall outer shield. This cable is also widely known as 22 AWG ABAM.

B.2.4 DSX-2

DSX-2 cross-connects can be engineered in a variety of configurations in the network. A simplified schematic diagram for a DSX is shown for reference in figure B.1. Typical electrical parameters associated with the DSX-2 cross-connect include:

– The insertion loss of the DSX-2 is typically less than the loss of 15 feet of individually shielded 22 gauge pairs.

– The return loss of the DSX-2 is typically greater than 26 dB at 3.156 MHz. The measurement is made at the out-jack including the effect of 15 feet of 22 gauge individually shielded twisted pairs to an in-jack which is terminated in 110 ohms ±5% tolerance.

– The crosstalk loss of the DSX-2 is typically greater than 55 dB at 3.156 MHz between the out-jack and the in-jack of adjacent signal paths. All other jacks are terminated with 110 ohms ±5% tolerance terminations.

– Protected (non-intrusive) monitoring access is provided through a high impedance bridging circuit consisting of 432 ohm ±5% tolerance resistors connected to the tip and ring conductors at the out-jack. This provides a monitor level 18.9 dB ±0.87 dB below the signal power.

– Typical engineering rules constrain cabling to and from equipment to the DSX-2 cross-connect to up to 1000 feet of multi-pair 22 AWG office cable with overall outer shield. This cable is also widely known as 22 AWG ABAM.

B.2.5 DSX-3

DSX-3 cross-connects can be engineered in a variety of configurations in the network. A simplified schematic diagram for a DSX is shown for reference in figure B.2. Typical

electrical parameters associated with the DSX-3 cross-connect include:

- The insertion loss of the DSX-3 is typically less than 1.15 dB at 22.368 MHz.

- The return loss of the DSX-3 is typically greater than 20 dB at 22.368 MHz. The measurement is made at the out-jack including the effect of 27 feet of cross-connect or patch cabling (WE Co 728 A cable or equivalent) to an in-jack which is terminated in 75 ohms ±5% tolerance.

- The crosstalk loss of the DSX-3 is typically greater than 55 dB at 22.368 MHz between the out-jack and the in-jack of adjacent signal paths. All other jacks are terminated with 75 ohm ±5% tolerance terminations.

- Protected (non-intrusive) monitoring access is provided through a bridging circuit connected to the center conductor and outer shield at the out-jack. This provides a monitor level 21.5 dB ±1.5 dB below the signal power.

- Typical engineering rules constrain cabling to and from equipment to the DSX-3 cross-connect to up to 450 feet of 75 ohm coaxial cable with tinned copper shield (WE Co 728 A cable or equivalent).

B.2.6 DSX-4NA

A simplified schematic diagram for a DSX is shown for reference in figure B.2. Typical electrical parameters associated with the DSX-4NA cross-connect include:

- The insertion loss of the DSX-4NA is typically less than 2.0 dB.

- The return loss of the DSX-4NA is typically greater than 20 dB at from 7 MHz to 280 MHz.

- The crosstalk loss of the DSX-4NA is typically greater than 50 dB from 7 MHz to 280 MHz between the out-jack and the in-jack of adjacent signal paths. All other jacks are terminated with 75 ohm ±5% tolerance terminations.

- Protected (non-intrusive) monitoring access is provided through a bridging circuit connected to the center conductor and outer shield at the out-jack. This provides a monitor level 21.5 dB ±1.5 dB below the signal power.

- Typical engineering rules constrain cabling to and from equipment to the DSX-4NA cross-connect to up to 225 feet of 75 ohm coaxial cable with tinned copper shield (WE Co 728 A cable or equivalent).

B.2.7 STSX-1

Characteristics to be determined.

B.2.8 STSX-3

Characteristics to be determined.